



#13

## SEQUENCE LISTING

&lt;110&gt; AKZO Nobel N.V.

&lt;120&gt; Helicobacter vaccine

&lt;130&gt; Degoedesequenties

&lt;140&gt;

&lt;141&gt;

&lt;160&gt; 21

&lt;170&gt; PatentIn Ver. 2.1

&lt;210&gt; 1

&lt;211&gt; 2883

&lt;212&gt; DNA

&lt;213&gt; Helicobacter felis

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (206) .. (886)

&lt;220&gt;

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&lt;222&gt; (897) .. (2603)

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taaaatttaa cacaaggagt aatag gtg aaa ctc aca ccc aaa gag caa gaa 232

Val Lys Leu Thr Pro Lys Glu Gln Glu

aag ttc ttg tta tat tat gcg ggc gaa gtg gct aga aag cgc aaa gca	280
Lys Phe,Leu Leu Tyr Tyr Ala Gly Glu Val Ala Arg Lys Arg Lys Ala	
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gag ggc tta aag ctc aac caa ccc gaa gcc att gct tac att agt gcc	328
Glu Gly Leu Lys Leu Asn Gln Pro Glu Ala Ile Ala Tyr Ile Ser Ala	
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cat att atg gac gaa gcg cgc cgt gga aaa aaa acc gtt gcc cag ctt	376
His Ile Met Asp Glu Ala Arg Arg Gly Lys Lys Thr Val Ala Gln Leu	
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atg gaa gag tgc atg cac ttt ttg aaa aaa gat gaa gta atg ccc ggg	424
Met Glu Glu Cys Met His Phe Leu Lys Lys Asp Glu Val Met Pro Gly	
60 65 70	
gtg ggt aat atg gtt ccc gat cta ggt gta gaa gcc acc ttt cct gat	472
Val Gly Asn Met Val Pro Asp Leu Gly Val Glu Ala Thr Phe Pro Asp	
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Gly Thr Lys Leu Val Thr Val Asn Trp Pro Ile Glu Pro Asp Glu His	
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ttc aaa gcg ggc gaa gtg aaa ttt ggt tgc gat aaa gac atc gag ctc	568
Phe Lys Ala Gly Glu Val Lys Phe Gly Cys Asp Lys Asp Ile Glu Leu	
110 115 120	
aat gca ggc aaa gaa gta acc gaa ctt gag gtt act aat gaa ggg cct	616
Asn Ala Gly Lys Glu Val Thr Glu Leu Glu Val Thr Asn Glu Gly Pro	
125 130 135	
aaa tcc ttg cat gtg ggt agc cat ttc cac ttc ttt gaa gct aac aag	664
Lys Ser Leu His Val Gly Ser His Phe His Phe Phe Glu Ala Asn Lys	
140 145 150	
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Ala Leu Lys Phe Asp Arg Glu Lys Ala Tyr Gly Lys Arg Leu Asp Ile  
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ccc tct ggc aac acg cta cgc att ggg gca gga caa acc cgc aaa gtg 760  
 Pro Ser Gly Asn Thr Leu Arg Ile Gly Ala Gly Gln Thr Arg Lys Val  
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cag ttg att cct ctt ggt ggc agt aaa aaa gtg att ggc atg aac ggg 808  
 Gln Leu Ile Pro Leu Gly Gly Ser Lys Lys Val Ile Gly Met Asn Gly  
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ctt gtg aat aac atc gcg gat gaa cgc cat aaa cat aaa gcg ctt gac 856  
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aag gcg aaa tct cac gga ttt atc aag taa ggagactccc atg aaa atg 905  
 Lys Ala Lys Ser His Gly Phe Ile Lys Met Lys Met  
 220 225 230

aaa aaa caa gaa tat gta aat acc tac gga ccc acc aaa ggc gat aaa 953  
 Lys Lys Gln Glu Tyr Val Asn Thr Tyr Gly Pro Thr Lys Gly Asp Lys  
 235 240 245

gtg cgc tta gga gat acc gat ctt tgg gca gaa gta gaa cat gac tat 1001  
 Val Arg Leu Gly Asp Thr Asp Leu Trp Ala Glu Val Glu His Asp Tyr  
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acc acc tat ggc gaa gaa ctt aaa ttt ggc gcg ggt aaa act atc cgt 1049  
 Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys Thr Ile Arg  
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gag ggt atg ggt cag agc aat agc cct gat gaa aac acc cta gat tta 1097  
 Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr Leu Asp Leu  
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gtc atc act aac gcg atg att atc gac tac acc ggg att tac aaa gcc 1145  
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gac att ggg att aaa aac ggc aaa atc cat ggc att ggc aag gca gga	1193
Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly Lys Ala Gly	
315 320 325	
aac aag gac atg caa gat ggc gta agc cct cat atg gtc gtg ggt gtg	1241
Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val Val Gly Val	
330 335 340	
ggc aca gaa gca cta gca ggg gaa ggt atg att att acc gct ggg gga	1289
Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr Ala Gly Gly	
345 350 355	
atc gat tca cac acc cac ttc ctt tct cca caa caa ttc cct acc gct	1337
Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe Pro Thr Ala	
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Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr Gly Pro Val	
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gat ggc acg aat gcg act act atc act ccg ggc aaa tgg aac ttg cac	1433
Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp Asn Leu His	
395 400 405	
cgc atg ttg cgc gca gca gaa gag tat tct atg aat gtg ggc ttt ttg	1481
Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val Gly Phe Leu	
410 415 420	
ggc aaa ggc aat agc tct agc aaa aaa caa ctt gta gaa caa gta gaa	1529
Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu Gln Val Glu	
425 430 435	
gcg ggc gcg att ggt ttt aaa ttg cat gaa gac tgg ggc aca aca cca	1577
Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly Thr Thr Pro	
440 445 450	
agt gcg atc gat cac tgc ttg agc gtg gca gat gaa tac gat gtg caa	1625

Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr Asp Val Gln  
 455 460 465 470

gtt tgt atc cac acc gat aca gtc aat gag gca ggt tat gta gat gac 1673  
 Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr Val Asp Asp  
 475 480 485

acc cta aat gca atg aac ggg cgc gcc atc cat gcc tac cac att gag 1721  
 Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr His Ile Glu  
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gga gcg ggt gga gga cac tca cct gat gtt atc acc atg gca ggc gag 1769  
 Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met Ala Gly Glu  
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ctc aat att cta ccc tcc tcc acc acc ccc act att ccc tat acc att 1817  
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aat acg gtt gca gaa cac tta gac atg ctc atg aca tgc cac cac cta 1865  
 Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys His His Leu  
 535 540 545 550

gac aaa cgc atc cgc gag gat tta caa ttt tct caa agc cgt atc cgc 1913  
 Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser Arg Ile Arg  
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ccc ggc tct atc gcg gct gaa gat gtg ctc cat gat atg ggt gtg atc 1961  
 Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Met Gly Val Ile  
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gcg atg aca agc tcg gat tcg caa gca atg ggg cgt gca ggc gaa gtg 2009  
 Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala Gly Glu Val  
 585 590 595

att cct cga act tgg cag act gcg gat aag aat aaa aaa gaa ttt ggt 2057  
 Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys Glu Phe Gly  
 600 605 610

aag ctt cct gaa gat ggc aaa gat aac gat aat ttc cgc att aag cgc	2105
Lys Leu Pro Glu Asp Gly Lys Asp Asn Asp Asn Phe Arg Ile Lys Arg	
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tac atc tcc aaa tac act atc aac ccc gct ttg acc cac ggc gtg agc	2153
Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His Gly Val Ser	
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gag tat atc ggc tct gtg gaa gag ggc aag atc gcc gac ttg gtg gtg	2201
Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp Leu Val Val	
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tgg aat cct gcc ttt ttt ggc gta aaa ccc aaa atc gtg atc aaa ggc	2249
Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val Ile Lys Gly	
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ggc atg gtg gtc ttc tct gaa atg ggc gat tct aac gcg tct gtg ccc	2297
Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala Ser Val Pro	
680                                  685                                  690	
act ccc caa ccg gtt tat tac cgc gaa atg ttt ggg cat cac ggc aag	2345
Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His His Gly Lys	
695                                  700                                  705                                  710	
gcg aaa ttt gac acc agc atc act ttt gtt tcc aaa gtc gcc tat gaa	2393
Ala Lys Phe Asp Thr Ser Ile Thr Phe Val Ser Lys Val Ala Tyr Glu	
715                                  720                                  725	
aat ggc gtg aaa gaa aag ctg ggc tta gag cgc caa gtt cta ccg gtc	2441
Asn Gly Val Lys Glu Lys Leu Gly Leu Glu Arg Gln Val Leu Pro Val	
730                                  735                                  740	
aaa aac tgc cgt aac atc acc aag aaa gac ttc aag ttc aac gac aaa	2489
Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe Asn Asp Lys	
745                                  750                                  755	
acg gca aaa atc acc gtc gat ccg aaa acc ttc gag gtc ttt gta gat	2537

Thr Ala Lys Ile Thr Val Asp Pro Lys Thr Phe Glu Val Phe Val Asp  
 760 765 770

ggc aaa ctc tgc acc tct aaa ccc acc tcg caa gtg cct cta gcc cag 2585  
 Gly Lys Leu Cys Thr Ser Lys Pro Thr Ser Gln Val Pro Leu Ala Gln  
 775 780 785 790

cgc tac act ttc ttc tag gcacaatgcc ccctttgggg gcaggttatt 2633  
 Arg Tyr Thr Phe Phe  
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ttaggaatct tcatcaaacg cacctgcaat cggctctgcg tgtgcgatcg tgtcgcttta 2693

aaacaacttt tcatctttaa gcaatcgcca tttttaatta atttaattct tataattaat 2753

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<211> 226

<212> PRT

<213> Helicobacter felis

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Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg  
 35 40 45

Arg Gly Lys Lys Thr Val Ala Gln Leu Met Glu Glu Cys Met His Phe

50

55

60

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp  
65 70 75 80

Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val  
85 90 95

Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys  
100 105 110

Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr  
115 120 125

Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser  
130 135 140

His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu  
145 150 155 160

Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg  
165 170 175

Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly  
180 185 190

Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp  
195 200 205

Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe  
210 215 220

Ile Lys  
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&lt;210&gt; 3

&lt;211&gt; 568



<212> PRT

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His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys  
35 40 45

Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr  
50 55 60

Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile  
65 70 75 80

Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly  
85 90 95

Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val  
100 105 110

Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr  
115 120 125

Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe  
130 135 140

Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr  
145 150 155 160

Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp  
165 170 175

Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val

180	185	190
Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu		
195	200	205
Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly		
210	215	220
Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr		
225	230	235 240
Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr		
245	250	255
Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr		
260	265	270
His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met		
275	280	285
Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser Thr Thr Pro Thr Ile Pro		
290	295	300
Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys		
305	310	315 320
His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser		
325	330	335
Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Met		
340	345	350
Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala		
355	360	365
Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys		
370	375	380

Glu Phe Gly Lys Leu Pro Glu Asp Gly Lys Asp Asn Asp Asn Phe Arg  
385 390 395 400

Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His  
405 410 415

Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp  
420 425 430

Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val  
435 440 445

Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala  
450 455 460

Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His  
465 470 475 480

His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val Ser Lys Val  
485 490 495

Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu Arg Gln Val  
500 505 510

Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe  
515 520 525

Asn Asp Lys Thr Ala Lys Ile Thr Val Asp Pro Lys Thr Phe Glu Val  
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Leu Ala Gln Arg Tyr Thr Phe Phe  
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15

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Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln

20

25

30

ccc gaa gcc att gcc tac att agt gcc cat att atg gac gag gcg cgc 144

Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg

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40

45

cgt ggc aaa aaa acc gtt gct gaa ctt atg gaa gaa tgt atg cac ttt 192

Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe

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55

60

ttg aaa aaa gat gag gtg atg ccc ggt gtg ggg aat atg gtc cct gat 240

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp

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70

75

80

ttg ggc gta gaa gcc act ttc ccc gat ggc acc aaa ctc gta acc gtg 288

Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val

85

90

95

aat tgg ccc att gaa cct gat gaa cac ttt aaa gcc ggt gaa gtg aaa	336
Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys	
100 105 110	
ttt ggc tgt gat aaa gac att gag ctc aac gcg ggt aag gaa gtt acc	384
Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr	
115 120 125	
gag ctt gaa gtt acc aac gaa gga cct aaa tcc ttg cat gtg ggt agc	432
Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser	
130 135 140	
cat ttc cac ttc ttt gaa acc aac aag gca ttg aaa ttc gat cgg gaa	480
His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg Glu	
145 150 155 160	
aaa gcc tat ggc aaa cgc cta gat att ccc tct ggc aac acg cta cgc	528
Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg	
165 170 175	
att ggg gca gga caa acc cgt aaa gtg cag tta atc cct ctt ggc ggt	576
Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly	
180 185 190	
agt aaa aaa gtg att ggc atg aac ggg ctt gtg aat aat att gcg gac	624
Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp	
195 200 205	
gaa cgc cat aaa cac aaa gca cta gac aag gca aaa tct cac gga ttc	672
Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe	
210 215 220	
atc aag taa ggagactccc atg aaa atg aaa aaa caa gag tat gta aac	721
Ile Lys Met Lys Met Lys Lys Gln Glu Tyr Val Asn	
225 230 235	
acc tac gga ccc acc aca ggc gat aaa gtg cgc tta gga gat acc gat	769
Thr Tyr Gly Pro Thr Thr Gly Asp Lys Val Arg Leu Gly Asp Thr Asp	

240

245

250

ctt tgg gca gaa gta gaa cat gac tat acc act tat ggc gaa gag ctc 817  
 Leu Trp Ala Glu Val Glu His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu

255

260

265

aaa ttt ggc gcg ggt aaa act atc cgt gag ggt atg ggt cag agc aat 865  
 Lys Phe Gly Ala Gly Lys Thr Ile Arg Glu Gly Met Gly Gln Ser Asn  
 270 275 280 285

agc cca gat gaa aac acc tta gat tta gtg atc acc aac gcg atg att 913  
 Ser Pro Asp Glu Asn Thr Leu Asp Leu Val Ile Thr Asn Ala Met Ile  
 290 295 300

atc gac tac acc ggg att tat aaa gcc gac att ggt att aaa aat ggc 961  
 Ile Asp Tyr Thr Gly Ile Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly  
 305 310 315

aaa atc cat ggt att ggc aag gcg ggg aac aaa gac atg caa gat ggc 1009  
 Lys Ile His Gly Ile Gly Lys Ala Gly Asn Lys Asp Met Gln Asp Gly  
 320 325 330

gta agc cct cat atg gtc gtg ggt gtg ggc aca gaa gca cta gca ggg 1057  
 Val Ser Pro His Met Val Val Gly Val Gly Thr Glu Ala Leu Ala Gly  
 335 340 345

gaa ggt atg att att acc gct ggg ggg atc gat tcg cac acc cac ttc 1105  
 Glu Gly Met Ile Ile Thr Ala Gly Gly Ile Asp Ser His Thr His Phe  
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ctc tct ccc caa caa ttc cct acc gct cta gcc aat ggt gtt aca acc 1153  
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 370 375 380

atg ttt gga ggt ggc aca ggt ccg gta gat ggc acg aat gcg acc acc 1201  
 Met Phe Gly Gly Gly Thr Gly Pro Val Asp Gly Thr Asn Ala Thr Thr  
 385 390 395

atc act ccg ggc aaa tgg aac ttg cac cgc atg ttg cgc gca gct gaa 1249  
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 400 405 410

gag tat tct atg aat gtg ggc ttt ttg ggc aaa ggc aat agc tcc agt 1297  
 Glu Tyr Ser Met Asn Val Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser  
 415 420 425

aaa aaa caa ctc gta gaa caa gta gaa gcg ggc gcg att ggc ttt aaa 1345  
 Lys Lys Gln Leu Val Glu Gln Val Glu Ala Gly Ala Ile Gly Phe Lys  
 430 435 440 445

ttg cat gaa gac tgg ggc aca aca cca agt gcg atc gat cac tgc ttg 1393  
 Leu His Glu Asp Trp Gly Thr Thr Pro Ser Ala Ile Asp His Cys Leu  
 450 455 460

agc gta gca gat gaa tac gat gtg caa gtt tgt atc cac acc gat acg 1441  
 Ser Val Ala Asp Glu Tyr Asp Val Gln Val Cys Ile His Thr Asp Thr  
 465 470 475

gtc aat gag gca ggt tat gta gat gac acc cta aat gcg atg aac ggg 1489  
 Val Asn Glu Ala Gly Tyr Val Asp Asp Thr Leu Asn Ala Met Asn Gly  
 480 485 490

cgc gcc atc cat gcc tac cac att gag gga gcg ggc gga gga cac tca 1537  
 Arg Ala Ile His Ala Tyr His Ile Glu Gly Ala Gly Gly Gly His Ser  
 495 500 505

cct gat gtt atc acc atg gca ggc gag ctc aat att cta ccc tcc tcc 1585  
 Pro Asp Val Ile Thr Met Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser  
 510 515 520 525

acc acc ccc act att ccc tat acc att aat acg gtt gca gaa cac tta 1633  
 Thr Thr Pro Thr Ile Pro Tyr Thr Ile Asn Thr Val Ala Glu His Leu  
 530 535 540

gac atg ctc atg acc tgc cac cac cta gac aaa cgc atc cgc gag gat 1681  
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550

555

ctc cag ttt tcc caa agc cgt atc cgc ccc ggc tct att gcc gct gaa 1729  
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560

565

570

gat gtg ctc cat gat att ggc gtg atc gcg atg aca agc tcg gat tcg 1777  
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580

585

caa gca atg ggg cgc gct ggg gaa gtg att cct aga act tgg caa act 1825  
 Gln Ala Met Gly Arg Ala Gly Glu Val Ile Pro Arg Thr Trp Gln Thr  
 590 595 600 605

gca gac aag aat aaa aaa gaa ttt ggt aag ctt cct gaa gat ggt gca 1873  
 Ala Asp Lys Asn Lys Lys Glu Phe Gly Lys Leu Pro Glu Asp Gly Ala  
 610 615 620

gat aat gac aac ttc cgc atc aaa cgc tat atc tcc aaa tac acc att 1921  
 Asp Asn Asp Asn Phe Arg Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile  
 625 630 635

aat ccc gct ttg acc cat ggc gtg agc gag tat atc ggc tct gtg gaa 1969  
 Asn Pro Ala Leu Thr His Gly Val Ser Glu Tyr Ile Gly Ser Val Glu  
 640 645 650

gag ggc aag atc gcc gac ttg gtg gtg tgg aat cct gct ttc ttt ggt 2017  
 Glu Gly Lys Ile Ala Asp Leu Val Val Trp Asn Pro Ala Phe Phe Gly  
 655 660 665

gta aaa ccc aaa atc gtg atc aaa ggc ggt atg gtg gtg ttc tct gaa 2065  
 Val Lys Pro Lys Ile Val Ile Lys Gly Gly Met Val Val Phe Ser Glu  
 670 675 680 685

atg ggc gat tct aac gcg tct gtg ccc aca cct cag ccg gtt tat tac 2113  
 Met Gly Asp Ser Asn Ala Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr  
 690 695 700



cgc gaa atg ttt ggg cat cac ggc aag gcg aaa ttt gac acc agc atc 2161  
 Arg Glu Met Phe Gly His His Gly Lys Ala Lys Phe Asp Thr Ser Ile

705 710 715

act ttt gtt tcc aaa gtc gcc tat gaa aat ggc gtg aaa gaa aaa cta 2209  
 Thr Phe Val Ser Lys Val Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu

720 725 730

ggc tta gag cgc aag gtg cta ccc gtg aaa aac tgc cgc aac atc act 2257  
 Gly Leu Glu Arg Lys Val Leu Pro Val Lys Asn Cys Arg Asn Ile Thr

735 740 745

aag aaa gac ttc aaa ttc aac aac aag acg gcg cat atc act gtc gat 2305  
 Lys Lys Asp Phe Lys Phe Asn Asn Lys Thr Ala His Ile Thr Val Asp

750 755 760 765

cct aaa acc ttc gag gtc ttt gta gat ggc aaa ctc tgc acc tct aaa 2353  
 Pro Lys Thr Phe Glu Val Phe Val Asp Gly Lys Leu Cys Thr Ser Lys

770 775 780

ccc gcc tct gaa gtg cct cta gcc caa cgc tac act ttc ttc tag 2398  
 Pro Ala Ser Glu Val Pro Leu Ala Gln Arg Tyr Thr Phe Phe

785 790 795

gcacaat 2405

<210> 5

<211> 226

<212> PRT

<213> Helicobacter felis

<400> 5

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1 5 10 15

Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln

20 25 30

Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg  
35 40 45

Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe  
50 55 60

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp  
65 70 75 80

Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val  
85 90 95

Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys  
100 105 110

Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr  
115 120 125

Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser  
130 135 140

His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg Glu  
145 150 155 160

Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg  
165 170 175

Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly  
180 185 190

Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp  
195 200 205

Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe  
210 215 220

Ile Lys

225

<210> 6

<211> 568

<212> PRT

<213> Helicobacter felis

<400> 6

Met Lys Met Lys Lys Gln Glu Tyr Val Asn Thr Tyr Gly Pro Thr Thr  
1 5 10 15

Gly Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Trp Ala Glu Val Glu  
20 25 30

His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys  
35 40 45

Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr  
50 55 60

Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile  
65 70 75 80

Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly  
85 90 95

Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val  
100 105 110

Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr  
115 120 125

Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe  
130 135 140

Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr  
145 150 155 160

Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp  
165 170 175

Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val  
180 185 190

Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu  
195 200 205

Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly  
210 215 220

Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr  
225 230 235 240

Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr  
245 250 255

Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr  
260 265 270

His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met  
275 280 285

Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser Thr Thr Pro Thr Ile Pro  
290 295 300

Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys  
305 310 315 320

His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser  
325 330 335

Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Ile  
340 345 350

Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala

355

360

365

Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys  
 370 375 380

Glu Phe Gly Lys Leu Pro Glu Asp Gly Ala Asp Asn Asp Asn Phe Arg  
 385 390 395 400

Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His  
 405 410 415

Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp  
 420 425 430

Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val  
 435 440 445

Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala  
 450 455 460

Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His  
 465 470 475 480

His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val Ser Lys Val  
 485 490 495

Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu Arg Lys Val  
 500 505 510

Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe  
 515 520 525

Asn Asn Lys Thr Ala His Ile Thr Val Asp Pro Lys Thr Phe Glu Val  
 530 535 540

Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Ala Ser Glu Val Pro  
 545 550 555 560

Leu Ala Gln Arg Tyr Thr Phe Phe  
565

<210> 7

<211> 2183

<212> DNA

<213> Helicobacter felis

<220>

<221> CDS

<222> (3)..(683)

<220>

<221> CDS

<222> (694)..(2181)

<400> 7

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Val Lys Leu Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr  
1 5 10 15

gcg ggc gaa gtg gct aga aag cgc aaa gca gag ggc tta aag ctc aat 95  
Ala Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn  
20 25 30

caa ccc gaa gcc att gcc tac att agt gcc cat att atg gac gag gcg 143  
Gln Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala  
35 40 45

cgc cgt ggc aaa aaa acc gtt gct gaa ctt atg gaa gaa tgt atg cac 191  
Arg Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His  
50 55 60

ttt ttg aaa aaa gat gag gtg atg ccc ggt gtg ggg aat atg gtc cct 239  
Phe Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro  
65 70 75

gat ttg ggc gta gaa gcc act ttc ccc gat ggc acc aaa ctc gta acc	287
Asp Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr	
80 85 90 95	
gtg aat tgg ccc att gaa cct gat gaa cac ttt aaa gcc ggt gaa gtg	335
Val Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val	
100 105 110	
aaa ttt ggc tgt gat aaa gac att gag ctc aac gtg ggt aag gaa gtt	383
Lys Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Val Gly Lys Glu Val	
115 120 125	
acc gag ctt gaa gtt acc aac gaa gga cct aaa tcc ttg cat gtg ggt	431
Thr Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly	
130 135 140	
agc cat ttc cac ttc ttt gaa acc aac aag gca ttg aaa ttc gat cgg	479
Ser His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg	
145 150 155	
gaa aaa gcc tat ggc aaa cgc cta gat att ccc tct ggc aac acg cta	527
Glu Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu	
160 165 170 175	
cgc att ggg gca gga caa acc cgt aaa gtg cag tta atc cct ctt ggc	575
Arg Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly	
180 185 190	
ggg agt aaa aaa gtg att ggc atg aac ggg ctt gtg aat aat att gcg	623
Gly Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala	
195 200 205	
gac gaa cgc cat aaa cac aaa gca cta gac aag gca aaa tct cac gga	671
Asp Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly	
210 215 220	
ttc atc aag taa ggagactccc atg aaa atg aaa aaa caa gag tat gta	720

Phe Ile Lys	Met Lys Met Lys Lys Gln Glu Tyr Val	
225	230	235
aac acc tac gga ccc acc aca ggc gat aaa gtg cgc tta gga gat acc	768	
Asn Thr Tyr Gly Pro Thr Thr Gly Asp Lys Val Arg Leu Gly Asp Thr		
240	245	250
gat ctt tgg gca gaa gta gaa cat gac tat acc act tat ggc gaa gag	816	
Asp Leu Trp Ala Glu Val Glu His Asp Tyr Thr Thr Tyr Gly Glu Glu		
255	260	265
ctc aaa ttt ggc gcg ggt aaa act atc cgt gag ggt atg ggt cag agc	864	
Leu Lys Phe Gly Ala Gly Lys Thr Ile Arg Glu Gly Met Gly Gln Ser		
270	275	280
aat agc cca gat gaa aac acc tta gat tta gtg atc acc aac gcg atg	912	
Asn Ser Pro Asp Glu Asn Thr Leu Asp Leu Val Ile Thr Asn Ala Met		
285	290	295
att atc gac tac acc ggg att tat aaa gcc gac att ggt att aaa aat	960	
Ile Ile Asp Tyr Thr Gly Ile Tyr Lys Ala Asp Ile Gly Ile Lys Asn		
305	310	315
ggc aaa atc cat ggt att ggc aag gcg ggg aac aaa gac atg caa gat	1008	
Gly Lys Ile His Gly Ile Gly Lys Ala Gly Asn Lys Asp Met Gln Asp		
320	325	330
ggc gta agc cct cat atg gtc gtg ggt gtg ggc aca gaa gca cta gca	1056	
Gly Val Ser Pro His Met Val Val Gly Val Gly Thr Glu Ala Leu Ala		
335	340	345
ggg gaa ggt atg att att acc gct ggg ggg atc gat tcg cac acc cac	1104	
Gly Glu Gly Met Ile Ile Thr Ala Gly Gly Ile Asp Ser His Thr His		
350	355	360
ttc ctc tct ccc caa caa ttc cct acc gct cta gcc aat ggt gtt aca	1152	
Phe Leu Ser Pro Gln Gln Phe Pro Thr Ala Leu Ala Asn Gly Val Thr		
365	370	375
		380



acc atg ttt gga ggt ggc aca ggt ccg gta gat ggc acg aat gcg acc	1200
Thr Met Phe Gly Gly Gly Thr Gly Pro Val Asp Gly Thr Asn Ala Thr	
385 390 395	
acc atc act ccg ggc aaa tgg aac ttg cac cgc atg ttg cgc gca gct	1248
Thr Ile Thr Pro Gly Lys Trp Asn Leu His Arg Met Leu Arg Ala Ala	
400 405 410	
gaa gag tat tct atg aat gta ggc ttt ttg ggc aaa ggc aat agt tct	1296
Glu Glu Tyr Ser Met Asn Val Gly Phe Leu Gly Lys Gly Asn Ser Ser	
415 420 425	
agc aaa aaa caa ctt gta gaa caa gta gaa gcg ggc gcg att ggc ttt	1344
Ser Lys Lys Gln Leu Val Glu Gln Val Glu Ala Gly Ala Ile Gly Phe	
430 435 440	
aaa ttg cat gaa gac tgg ggc aca aca cca agt gcg atc gat cac tgc	1392
Lys Leu His Glu Asp Trp Gly Thr Thr Pro Ser Ala Ile Asp His Cys	
445 450 455 460	
ttg agc gtg gca gat gaa tac gat gtg caa gtt tgt atc cac acc gat	1440
Leu Ser Val Ala Asp Glu Tyr Asp Val Gln Val Cys Ile His Thr Asp	
465 470 475	
acg gtc aat gag gca ggt tat gtg gat gac acc cta aat gca atg aac	1488
Thr Val Asn Glu Ala Gly Tyr Val Asp Asp Thr Leu Asn Ala Met Asn	
480 485 490	
ggg cgc gcc atc cat gcc tac cac att gag gga gcg ggc gga gga cac	1536
Gly Arg Ala Ile His Ala Tyr His Ile Glu Gly Ala Gly Gly Gly His	
495 500 505	
tca cct gat gtt atc acc atg gca ggc gag ctc aat att cta ccc tcc	1584
Ser Pro Asp Val Ile Thr Met Ala Gly Glu Leu Asn Ile Leu Pro Ser	
510 515 520	
tcc acc acc ccc act att ccc tat acc att aat acg gtt gca gaa cac	1632

Ser Thr Thr Pro Thr Ile Pro Tyr Thr Ile Asn Thr Val Ala Glu His  
 525 530 535 540

tta gac atg ctc atg acc tgc cac cac cta gat aag cgc atc cgc gag 1680  
 Leu Asp Met Leu Met Thr Cys His His Leu Asp Lys Arg Ile Arg Glu  
 545 550 555

gat tta caa ttt tct caa agc cgt atc cgc ccc gga tct att gcc gct 1728  
 Asp Leu Gln Phe Ser Gln Ser Arg Ile Arg Pro Gly Ser Ile Ala Ala  
 560 565 570

gag gat gtg ctc cat gat att ggc gtg atc gcg atg act agc tcc gat 1776  
 Glu Asp Val Leu His Asp Ile Gly Val Ile Ala Met Thr Ser Ser Asp  
 575 580 585

tcg caa gca atg ggg cgc gct ggg gaa gtg att cct aga act tgg caa 1824  
 Ser Gln Ala Met Gly Arg Ala Gly Glu Val Ile Pro Arg Thr Trp Gln  
 590 595 600

act gca gat aag aat aaa aaa gaa ttt ggt aag ctt cct gaa gat ggt 1872  
 Thr Ala Asp Lys Asn Lys Lys Glu Phe Gly Lys Leu Pro Glu Asp Gly  
 605 610 615 620

gca gat aac gac aac ttc cgc atc aaa cgc tat atc tcc aaa tac acc 1920  
 Ala Asp Asn Asp Asn Phe Arg Ile Lys Arg Tyr Ile Ser Lys Tyr Thr  
 625 630 635

att aat ccc gct ttg acc cat ggc gtg agc gag tat atc ggc tct gtg 1968  
 Ile Asn Pro Ala Leu Thr His Gly Val Ser Glu Tyr Ile Gly Ser Val  
 640 645 650

gaa gag ggc aag atc gcc gac ttg gtg gtg tgg aat cct gcc ttt ttt 2016  
 Glu Glu Gly Lys Ile Ala Asp Leu Val Val Trp Asn Pro Ala Phe Phe  
 655 660 665

ggc gtg aaa cct aag att gtg att aaa ggt ggc atg gtg gtc ttc tct 2064  
 Gly Val Lys Pro Lys Ile Val Ile Lys Gly Gly Met Val Val Phe Ser  
 670 675 680

gaa atg ggc gat tct aac gcg tcc gtg ccc acg cct cag ccg gtt tat 2112  
 Glu Met Gly Asp Ser Asn Ala Ser Val Pro Thr Pro Gln Pro Val Tyr  
 685 690 695 700

tac cgc gaa atg ttt ggg cac cac ggc aag gcg aaa ttt gac acc agc 2160  
 Tyr Arg Glu Met Phe Gly His His Gly Lys Ala Lys Phe Asp Thr Ser  
 705 710 715

atc act ttt cgt gtc tca agc gg 2183  
 Ile Thr Phe Arg Val Ser Ser  
 720

<210> 8

<211> 226

<212> PRT

<213> Helicobacter felis

<400> 8

Val Lys Leu Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr Ala  
 1 5 10 15

Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln  
 20 25 30

Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg  
 35 40 45

Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe  
 50 55 60

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp  
 65 70 75 80

Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val  
 85 90 95

Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys  
100 105 110

Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Val Gly Lys Glu Val Thr  
115 120 125

Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser  
130 135 140

His Phe His Phe Phe Glu Thr Asn Lys Ala Leu Lys Phe Asp Arg Glu  
145 150 155 160

Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg  
165 170 175

Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly  
180 185 190

Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp  
195 200 205

Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe  
210 215 220

Ile Lys  
225

<210> 9

<211> 496

<212> PRT

<213> Helicobacter felis

<400> 9

Met Lys Met Lys Lys Gln Glu Tyr Val Asn Thr Tyr Gly Pro Thr Thr  
1 5 10 15

Gly Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Trp Ala Glu Val Glu

20	25	30
His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys		
35	40	45
Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr		
50	55	60
Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile		
65	70	75 80
Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly		
85	90	95
Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val		
100	105	110
Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr		
115	120	125
Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe		
130	135	140
Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr		
145	150	155 160
Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp		
165	170	175
Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val		
180	185	190
Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu		
195	200	205
Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly		
210	215	220

Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr  
225 230 235 240

Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr  
245 250 255

Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr  
260 265 270

His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met  
275 280 285

Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser Thr Thr Pro Thr Ile Pro  
290 295 300

Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys  
305 310 315 320

His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser  
325 330 335

Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Ile  
340 345 350

Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala  
355 360 365

Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys  
370 375 380

Glu Phe Gly Lys Leu Pro Glu Asp Gly Ala Asp Asn Asp Asn Phe Arg  
385 390 395 400

Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His  
405 410 415

Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp  
420 425 430

Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val  
 ,435 440 445

Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala  
 450 455 460

Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His  
 465 470 475 480

His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Arg Val Ser Ser  
 485 490 495

<210> 10

<211> 2407

<212> DNA

<213> Helicobacter felis

<220>

<221> CDS

<222> (2)..(682)

<220>

<221> CDS

<222> (693)..(2399)

<400> 10

c gtg aaa ctc aca ccc aaa gag caa gaa aag ttc ttg tta tat tat gcg 49  
 Val Lys Leu Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr Ala  
 1 5 10 15

ggc gaa gtg gct aga aag cgc aaa gcg gag ggc tta aag ctc aac caa 97  
 Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln  
 20 25 30

ccc gaa gcc att gcc tac att agt gcc cat att atg gac gag gcg cgc 145

Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg  
 35 40 45

cgt ggc aaa aag acc gtt gcg gaa ctt atg gaa gag tgt atg cac ttt 193  
 Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe  
 50 55 60

ttg aaa aaa gac gag gtg atg ccc ggt gtg ggg aat atg gtc cct gat 241  
 Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp  
 65 70 75 80

tta ggc gtg gaa gct act ttt ccc gat ggc acc aaa ctc gta acc gtg 289  
 Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val  
 85 90 95

aat tgg ccc atc gaa ccc gat gaa cac ttc aaa gcg ggc gaa gtc aaa 337  
 Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys  
 100 105 110

ttt ggc tgt gat aaa gac att gaa ctc aac gca ggt aag gaa gtt acc 385  
 Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr  
 115 120 125

gaa cta gaa gtt acc aac gaa gga cct aaa tcc ttg cat gtg ggt agc 433  
 Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser  
 130 135 140

cat ttc cac ttc ttt gaa gcc aac aag gca ttg aaa ttc gat cgg gaa 481  
 His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu  
 145 150 155 160

aaa gcc tat ggc aaa cgc cta gat att ccc tct ggc aac acg cta cgc 529  
 Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg  
 165 170 175

att ggg gca gga caa acc cgt aaa gtg cag tta atc cct ctt ggc ggc 577  
 Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly  
 180 185 190



agt aaa aaa gtg att ggc atg aac ggg ctt gtg aat aat att gca gat	625
Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp	
195 200 205	
gaa cgc cat aaa cac aaa gcg tta gaa aaa gca aaa tct cac gga ttt	673
Glu Arg His Lys His Lys Ala Leu Glu Lys Ala Lys Ser His Gly Phe	
210 215 220	
atc aaa taa ggagactccc atg aaa atg aaa aaa caa gag tat gta aat	722
Ile Lys Met Lys Met Lys Lys Gln Glu Tyr Val Asn	
225 230 235	
acc tac gga cct acc aca ggc gac aaa gtg cgc tta gga gat acc gat	770
Thr Tyr Gly Pro Thr Thr Gly Asp Lys Val Arg Leu Gly Asp Thr Asp	
240 245 250	
ctt tgg gca gaa gta gaa cat gac tat acc act tat ggc gaa gag ctc	818
Leu Trp Ala Glu Val Glu His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu	
255 260 265	
aaa ttt ggc gcg ggt aaa act atc cgt gag ggc atg ggt cag agc aat	866
Lys Phe Gly Ala Gly Lys Thr Ile Arg Glu Gly Met Gly Gln Ser Asn	
270 275 280 285	
agt cca gat gaa aac acc cta gat tta gtc atc acc aac gcg atg att	914
Ser Pro Asp Glu Asn Thr Leu Asp Leu Val Ile Thr Asn Ala Met Ile	
290 295 300	
att gac tac acc ggg att tac aaa gcc gac att ggc att aaa aat ggc	962
Ile Asp Tyr Thr Gly Ile Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly	
305 310 315	
aaa atc cat ggc att ggc aag gca gga aac aag gac atg caa gat ggc	1010
Lys Ile His Gly Ile Gly Lys Ala Gly Asn Lys Asp Met Gln Asp Gly	
320 325 330	
gta agc cct cat atg gtc gtg ggt gtg ggc aca gaa gca tta gca ggg	1058

Val Ser Pro His Met Val Val Gly Val Gly Thr Glu Ala Leu Ala Gly  
 335 340 345

gaa ggt atg att att acc gct ggg ggg atc gat tca cac acc cac ttc 1106  
 Glu Gly Met Ile Ile Thr Ala Gly Gly Ile Asp Ser His Thr His Phe  
 350 355 360 365

ctc tct cca caa caa ttc cct acc gct cta gcc aat ggc gtt aca acc 1154  
 Leu Ser Pro Gln Gln Phe Pro Thr Ala Leu Ala Asn Gly Val Thr Thr  
 370 375 380

atg ttt ggc ggt ggc aca ggt ccg gta gat ggc acg aat gcg act acc 1202  
 Met Phe Gly Gly Gly Thr Gly Pro Val Asp Gly Thr Asn Ala Thr Thr  
 385 390 395

atc act ccg ggc aaa tgg aac ttg cac cgc atg ttg cgc gca gct gaa 1250  
 Ile Thr Pro Gly Lys Trp Asn Leu His Arg Met Leu Arg Ala Ala Glu  
 400 405 410

gag tat tct atg aat gtg ggc ttt ttg ggc aaa ggc aat agc tcc agt 1298  
 Glu Tyr Ser Met Asn Val Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser  
 415 420 425

aaa aaa caa ctt gta gaa caa ata gaa gcg ggc gcg atc ggc ttt aaa 1346  
 Lys Lys Gln Leu Val Glu Gln Ile Glu Ala Gly Ala Ile Gly Phe Lys  
 430 435 440 445

ttg cat gaa gac tgg ggc aca act cca agt gca atc gat cac tgc ttg 1394  
 Leu His Glu Asp Trp Gly Thr Thr Pro Ser Ala Ile Asp His Cys Leu  
 450 455 460

agc gta gca gat gaa tac gat gtg caa gtt tgt atc cac acc gat acg 1442  
 Ser Val Ala Asp Glu Tyr Asp Val Gln Val Cys Ile His Thr Asp Thr  
 465 470 475

gtc aat gag gca ggt tat gta gat gac acc ctg aat gcg atg aac ggg 1490  
 Val Asn Glu Ala Gly Tyr Val Asp Asp Thr Leu Asn Ala Met Asn Gly  
 480 485 490

cgc gcc atc cat gcc tac cac att gag gga gcg ggc gga gga cac tca	1538
Arg Ala Ile His Ala Tyr His Ile Glu Gly Ala Gly Gly Gly His Ser	
495 500 505	
cct gat gtt atc acc atg gca ggc gag ctc aat att cta ccc tcc tcc	1586
Pro Asp Val Ile Thr Met Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser	
510 515 520 525	
aca acc ccc act atc ccc tat acc att aat acg gtt gca gaa cac tta	1634
Thr Thr Pro Thr Ile Pro Tyr Thr Ile Asn Thr Val Ala Glu His Leu	
530 535 540	
gac atg ctc atg acc tgc cac cac cta gat aaa cgc atc cgc gag gat	1682
Asp Met Leu Met Thr Cys His His Leu Asp Lys Arg Ile Arg Glu Asp	
545 550 555	
tta caa ttt tcc caa agc cgt atc cgc ccc ggc tct atc gcc gct gaa	1730
Leu Gln Phe Ser Gln Ser Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu	
560 565 570	
gat gtg ctc cat gat att ggc gtg atc gcg atg aca agc tcg gat tcg	1778
Asp Val Leu His Asp Ile Gly Val Ile Ala Met Thr Ser Ser Asp Ser	
575 580 585	
caa gca atg ggg cgc gct ggc gaa gtg att cct cga act tgg cag act	1826
Gln Ala Met Gly Arg Ala Gly Glu Val Ile Pro Arg Thr Trp Gln Thr	
590 595 600 605	
gcg gat aag aat aaa aaa gaa ttt ggt aag ctt cct gaa gat agt gca	1874
Ala Asp Lys Asn Lys Lys Glu Phe Gly Lys Leu Pro Glu Asp Ser Ala	
610 615 620	
gat aac gac aac ttc cgt atc aaa cgc tac atc tcc aaa tac act att	1922
Asp Asn Asp Asn Phe Arg Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile	
625 630 635	
aac ccc gct cta acc cat ggg gta agc gag tat atc ggc tct gtg gaa	1970

Asn Pro Ala Leu Thr His Gly Val Ser Glu Tyr Ile Gly Ser Val Glu  
640 645 650

gag ggc aaa atc gct gat ttg gtg gtg tgg aat cct gcc ttt ttt ggt 2018  
Glu Gly Lys Ile Ala Asp Leu Val Val Trp Asn Pro Ala Phe Phe Gly  
655 660 665

gtg aaa cct aag att gtg atc aaa ggc ggt atg gtg gtc ttc tct gaa 2066  
Val Lys Pro Lys Ile Val Ile Lys Gly Gly Met Val Val Phe Ser Glu  
670 675 680 685

atg ggc gac tcc aac gcg tcc gtg cct aca cct cag ccg gtt tat tac 2114  
Met Gly Asp Ser Asn Ala Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr  
690 695 700

cgc gaa atg ttt ggg cat cac ggc aag gcg aaa ttt gac acc agc atc 2162  
Arg Glu Met Phe Gly His His Gly Lys Ala Lys Phe Asp Thr Ser Ile  
705 710 715

act ttt gtt tcc aaa gtc gcc tat gaa aat ggc gtg aaa gaa aaa cta 2210  
Thr Phe Val Ser Lys Val Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu  
720 725 730

ggc tta gag cgc aag gtg cta ccc gtg aaa aac tgc cgc aac atc act 2258  
Gly Leu Glu Arg Lys Val Leu Pro Val Lys Asn Cys Arg Asn Ile Thr  
735 740 745

aag aaa gac ttc aaa ttc aac aac aag acg gcg cat atc act gtc gat 2306  
Lys Lys Asp Phe Lys Phe Asn Asn Lys Thr Ala His Ile Thr Val Asp  
750 755 760 765

cct aaa acc ttc gag gtc ttt gta gat ggc aaa ctc tgc acc tct aaa 2354  
Pro Lys Thr Phe Glu Val Phe Val Asp Gly Lys Leu Cys Thr Ser Lys  
770 775 780

ccc gcc tct gaa gtg cct cta gcc cag cgc tac act ttc ttc tag 2399  
Pro Ala Ser Glu Val Pro Leu Ala Gln Arg Tyr Thr Phe Phe  
785 790 795

gcncaatg

2407

<210> 11

<211> 226

<212> PRT

<213> Helicobacter felis

<400> 11

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Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln  
20 25 30

Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg  
35 40 45

Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe  
50 55 60

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp  
65 70 75 80

Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val  
85 90 95

Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys  
100 105 110

Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr  
115 120 125

Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser  
130 135 140

His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu

145                      150                      155                      160

Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg  
                    165                      170                      175

Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly  
                    180                      185                      190

Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp  
                    195                      200                      205

Glu Arg His Lys His Lys Ala Leu Glu Lys Ala Lys Ser His Gly Phe  
                    210                      215                      220

Ile Lys

225

<210> 12

<211> 568

<212> PRT

<213> Helicobacter felis

<400> 12

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Gly Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Trp Ala Glu Val Glu  
                    20                      25                      30

His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys  
                    35                      40                      45

Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr  
                    50                      55                      60

Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile  
                    65                      70                      75                      80

Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly  
85 90 95

Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val  
100 105 110

Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr  
115 120 125

Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe  
130 135 140

Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr  
145 150 155 160

Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp  
165 170 175

Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val  
180 185 190

Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu  
195 200 205

Gln Ile Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly  
210 215 220

Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr  
225 230 235 240

Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr  
245 250 255

Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr  
260 265 270

His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met

275

280

285

Ala Gly Glu Leu Asn Ile Leu Pro Ser Ser Thr Thr Pro Thr Ile Pro  
290 295 300

Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys  
305 310 315 320

His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser  
325 330 335

Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Ile  
340 345 350

Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala  
355 360 365

Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys  
370 375 380

Glu Phe Gly Lys Leu Pro Glu Asp Ser Ala Asp Asn Asp Asn Phe Arg  
385 390 395 400

Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His  
405 410 415

Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp  
420 425 430

Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val  
435 440 445

Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala  
450 455 460

Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His  
465 470 475 480



His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val Ser Lys Val  
485 490 495

Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu Arg Lys Val  
500 505 510

Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe  
515 520 525

Asn Asn Lys Thr Ala His Ile Thr Val Asp Pro Lys Thr Phe Glu Val  
530 535 540

Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Ala Ser Glu Val Pro  
545 550 555 560

Leu Ala Gln Arg Tyr Thr Phe Phe  
565

<210> 13

<211> 2452

<212> DNA

<213> Helicobacter felis

<220>

<221> CDS

<222> (48)..(728)

<220>

<221> CDS

<222> (739)..(2445)

<400> 13

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Val Lys Leu

aca ccc aaa gag caa gaa aag ttc ttg tta tat tat gcg ggc gaa gtg	104
Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr Ala Gly Glu Val	
5 10 15	
gct aga aag cgc aaa gca gag ggc tta aag ctc aac caa ccc gaa gcc	152
Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln Pro Glu Ala	
20 25 30 35	
att gcc tac att agt gcc cat att atg gac gag gcg cgt cgt ggc aaa	200
Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg Arg Gly Lys	
40 45 50	
aaa acc gtt gcg gaa ctt atg gaa gag tgt atg cac ttt ttg aaa aaa	248
Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe Leu Lys Lys	
55 60 65	
gac gag gtg atg ccc ggg gtg ggg aat atg gtc cct gat ttg ggc gtg	296
Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp Leu Gly Val	
70 75 80	
gaa gcc act ttc ccc gat ggc acc aaa ctc gta act gtg aat tgg ccc	344
Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val Asn Trp Pro	
85 90 95	
atc gaa cct gat gaa cac ttt aag gcg ggt gaa gtg aaa ttt ggc tgt	392
Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys Phe Gly Cys	
100 105 110 115	
gat aaa gac att gaa ctc aac gca ggt aag gaa gtt acc gaa cta gaa	440
Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr Glu Leu Glu	
120 125 130	
gtt act aac gaa gga cct aaa tcc ttg cat gtg ggt agc cat ttc cac	488
Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser His Phe His	
135 140 145	
ttc ttt gaa gcc aac aaa gca ttg aaa ttc gat cgg gaa aaa gcc tat	536
Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu Lys Ala Tyr	

150	155	160	
ggc aaa cgc cta gat att ccc tct ggc aac aca cta cgc att ggg gca			584
Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg Ile Gly Ala			
165	170	175	
gga caa acc cgt aaa gtg cag tta atc cct ctt ggc ggt agt aaa aaa			632
Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly Ser Lys Lys			
180	185	190	195
gtg att ggc atg aac ggg ctt gtg aat aat att gcg gac gaa cgc cat			680
Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp Glu Arg His			
200	205	210	
aaa cac aaa gcg cta gac aaa gca aaa tct cac gga ttt atc aag taa			728
Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe Ile Lys			
215	220	225	
ggagactccc atg aaa atg aaa aaa caa gag tat gta aat acc tac gga			777
Met Lys Met Lys Lys Gln Glu Tyr Val Asn Thr Tyr Gly			
230	235	240	
ccc acc aca ggc gat aaa gtg cgc tta gga gat acc gat ctt tgg gca			825
Pro Thr Thr Gly Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Trp Ala			
245	250	255	
gaa gta gaa cat gac tat acc acc tat ggc gaa gaa ctc aaa ttc ggt			873
Glu Val Glu His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly			
260	265	270	
gca ggt aaa act atc cgt gag ggt atg ggt cag agc aat agc cca gat			921
Ala Gly Lys Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp			
275	280	285	
gaa aac acc tta gat tta gtg atc acc aac gcg atg att att gac tac			969
Glu Asn Thr Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr			
290	295	300	

acc ggg att tac aaa gcc gac att ggc att aaa aat ggc aaa atc cat	1017
Thr Gly Ile Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His	
305                      310                      315                      320	
ggc att ggc aag gca gga aac aag gac atg caa gat ggc gta agc cct	1065
Gly Ile Gly Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro	
325                      330                      335	
cat atg gtc gtg ggt gtg ggc aca gaa gca cta gca ggg gaa ggt atg	1113
His Met Val Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met	
340                      345                      350	
att att acc gct ggg ggg atc gat tca cac acc cac ttc ctc tct cca	1161
Ile Ile Thr Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro	
355                      360                      365	
caa caa ttc cct acc gct cta gcc aat ggc gtt aca aca atg ttt ggc	1209
Gln Gln Phe Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly	
370                      375                      380	
ggg ggc aca ggc ccc gta gat ggc acg aat gcg act acc atc act ccg	1257
Gly Gly Thr Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro	
385                      390                      395                      400	
ggc aaa tgg aac ttg cac cgc atg ttg cgc gca gca gaa gag tat tct	1305
Gly Lys Trp Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser	
405                      410                      415	
atg aat gtg ggc ttt ttg ggc aaa ggc aat agc tct agt aaa aaa caa	1353
Met Asn Val Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln	
420                      425                      430	
ctt gta gaa caa gta gaa gcg ggc gcg att ggt ttt aaa ttg cat gaa	1401
Leu Val Glu Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu	
435                      440                      445	
gac tgg ggc aca act cca agt gcg atc gat cac tgc ttg agc gta gca	1449
Asp Trp Gly Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala	

450	455	460	
gat gaa tac gat gtg caa gtt tgt ata cac acc gat acg gtc aat gag			1497
Asp Glu Tyr Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu			
465	470	475	480
gca ggt tat gta gat gac acc cta aat gca atg aac ggg cgc gcc atc			1545
Ala Gly Tyr Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile			
	485	490	495
cat gcc tac cac att gag gga gcg ggt gga gga cac tca cct gat gtt			1593
His Ala Tyr His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val			
	500	505	510
atc acc atg gca ggc gaa gtg aat att cta ccc tcc tcc aca acc cct			1641
Ile Thr Met Ala Gly Glu Val Asn Ile Leu Pro Ser Ser Thr Thr Pro			
	515	520	525
act atc ccc tat acc att aat acg gtt gca gaa cac tta gac atg ctt			1689
Thr Ile Pro Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu			
	530	535	540
atg acc tgc cac cac cta gat aaa cgc atc cgc gag gat ctc caa ttt			1737
Met Thr Cys His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe			
545	550	555	560
tct caa agc cgt atc cgc ccc ggc tct atc gcc gct gaa gat gtg ctc			1785
Ser Gln Ser Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu			
	565	570	575
cat gat atc ggt gtg atc gcg atg aca agt tcc gat tcg caa gca atg			1833
His Asp Ile Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met			
	580	585	590
ggg cgc gct ggg gaa gtg att cct aga act tgg caa act gca gac aag			1881
Gly Arg Ala Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys			
	595	600	605

aat aaa aaa gaa ttt ggt aag ctt cct gaa gat ggt gca gat aat gac	1929
Asn Lys Lys Glu Phe Gly Lys Leu Pro Glu Asp Gly Ala Asp Asn Asp	
610 , 615 620	
aac ttc cgc atc aaa cgc tat atc tcc aaa tac acc att aat ccc gct	1977
Asn Phe Arg Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala	
625 630 635 640	
ttg acc cat ggc gtg agc gag tat atc ggc tct gtg gaa gag ggc aag	2025
Leu Thr His Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys	
645 650 655	
atc gcc gac ttg gtg gtg tgg aat cct gcc ttt ttt ggc gta aaa ccc	2073
Ile Ala Asp Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro	
660 665 670	
aaa atc gtg atc aaa ggc ggt atg gtg gtg ttc tct gaa atg ggc gat	2121
Lys Ile Val Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp	
675 680 685	
tct aat gcg tct gtg ccc act cct cag ccg gtt tat tac cgc gaa atg	2169
Ser Asn Ala Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met	
690 695 700	
ttt ggg cat cac ggc aag gcg aaa ttt gac acc agc atc act ttt gtt	2217
Phe Gly His His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val	
705 710 715 720	
tcc aaa gtc gcc tat gaa aat ggt gtg aaa gaa aaa cta ggt tta gag	2265
Ser Lys Val Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu	
725 730 735	
cgc aag gtg ctc ccc gtg aaa aac tgc cgt aac atc acc aag aag gac	2313
Arg Lys Val Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp	
740 745 750	
ttc aag ttc aac gac aaa act gca aaa atc acc gtc gat ccg aaa acc	2361
Phe Lys Phe Asn Asp Lys Thr Ala Lys Ile Thr Val Asp Pro Lys Thr	

755

760

765

ttc gag gtc ttt gta gat ggc aaa ctc tgc acc tct aaa ccc acc tct 2409

Phe Glu Val Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Thr Ser

770

775

780

gaa gtg cct cta gcc caa cgc tac act ttc ttc tag gcataat 2452

Glu Val Pro Leu Ala Gln Arg Tyr Thr Phe Phe

785

790

795

&lt;210&gt; 14

&lt;211&gt; 226

&lt;212&gt; PRT

&lt;213&gt; Helicobacter felis

&lt;400&gt; 14

Val Lys Leu Thr Pro Lys Glu Gln Glu Lys Phe Leu Leu Tyr Tyr Ala

1

5

10

15

Gly Glu Val Ala Arg Lys Arg Lys Ala Glu Gly Leu Lys Leu Asn Gln

20

25

30

Pro Glu Ala Ile Ala Tyr Ile Ser Ala His Ile Met Asp Glu Ala Arg

35

40

45

Arg Gly Lys Lys Thr Val Ala Glu Leu Met Glu Glu Cys Met His Phe

50

55

60

Leu Lys Lys Asp Glu Val Met Pro Gly Val Gly Asn Met Val Pro Asp

65

70

75

80

Leu Gly Val Glu Ala Thr Phe Pro Asp Gly Thr Lys Leu Val Thr Val

85

90

95

Asn Trp Pro Ile Glu Pro Asp Glu His Phe Lys Ala Gly Glu Val Lys

100

105

110

Phe Gly Cys Asp Lys Asp Ile Glu Leu Asn Ala Gly Lys Glu Val Thr  
115 120 125

Glu Leu Glu Val Thr Asn Glu Gly Pro Lys Ser Leu His Val Gly Ser  
130 135 140

His Phe His Phe Phe Glu Ala Asn Lys Ala Leu Lys Phe Asp Arg Glu  
145 150 155 160

Lys Ala Tyr Gly Lys Arg Leu Asp Ile Pro Ser Gly Asn Thr Leu Arg  
165 170 175

Ile Gly Ala Gly Gln Thr Arg Lys Val Gln Leu Ile Pro Leu Gly Gly  
180 185 190

Ser Lys Lys Val Ile Gly Met Asn Gly Leu Val Asn Asn Ile Ala Asp  
195 200 205

Glu Arg His Lys His Lys Ala Leu Asp Lys Ala Lys Ser His Gly Phe  
210 215 220

Ile Lys  
225

<210> 15

<211> 568

<212> PRT

<213> Helicobacter felis

<400> 15

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20 25 30

His Asp Tyr Thr Thr Tyr Gly Glu Glu Leu Lys Phe Gly Ala Gly Lys



35

40

45

Thr Ile Arg Glu Gly Met Gly Gln Ser Asn Ser Pro Asp Glu Asn Thr  
50 55 60

Leu Asp Leu Val Ile Thr Asn Ala Met Ile Ile Asp Tyr Thr Gly Ile  
65 70 75 80

Tyr Lys Ala Asp Ile Gly Ile Lys Asn Gly Lys Ile His Gly Ile Gly  
85 90 95

Lys Ala Gly Asn Lys Asp Met Gln Asp Gly Val Ser Pro His Met Val  
100 105 110

Val Gly Val Gly Thr Glu Ala Leu Ala Gly Glu Gly Met Ile Ile Thr  
115 120 125

Ala Gly Gly Ile Asp Ser His Thr His Phe Leu Ser Pro Gln Gln Phe  
130 135 140

Pro Thr Ala Leu Ala Asn Gly Val Thr Thr Met Phe Gly Gly Gly Thr  
145 150 155 160

Gly Pro Val Asp Gly Thr Asn Ala Thr Thr Ile Thr Pro Gly Lys Trp  
165 170 175

Asn Leu His Arg Met Leu Arg Ala Ala Glu Glu Tyr Ser Met Asn Val  
180 185 190

Gly Phe Leu Gly Lys Gly Asn Ser Ser Ser Lys Lys Gln Leu Val Glu  
195 200 205

Gln Val Glu Ala Gly Ala Ile Gly Phe Lys Leu His Glu Asp Trp Gly  
210 215 220

Thr Thr Pro Ser Ala Ile Asp His Cys Leu Ser Val Ala Asp Glu Tyr  
225 230 235 240

Asp Val Gln Val Cys Ile His Thr Asp Thr Val Asn Glu Ala Gly Tyr  
245 250 255

Val Asp Asp Thr Leu Asn Ala Met Asn Gly Arg Ala Ile His Ala Tyr  
260 265 270

His Ile Glu Gly Ala Gly Gly Gly His Ser Pro Asp Val Ile Thr Met  
275 280 285

Ala Gly Glu Val Asn Ile Leu Pro Ser Ser Thr Thr Pro Thr Ile Pro  
290 295 300

Tyr Thr Ile Asn Thr Val Ala Glu His Leu Asp Met Leu Met Thr Cys  
305 310 315 320

His His Leu Asp Lys Arg Ile Arg Glu Asp Leu Gln Phe Ser Gln Ser  
325 330 335

Arg Ile Arg Pro Gly Ser Ile Ala Ala Glu Asp Val Leu His Asp Ile  
340 345 350

Gly Val Ile Ala Met Thr Ser Ser Asp Ser Gln Ala Met Gly Arg Ala  
355 360 365

Gly Glu Val Ile Pro Arg Thr Trp Gln Thr Ala Asp Lys Asn Lys Lys  
370 375 380

Glu Phe Gly Lys Leu Pro Glu Asp Gly Ala Asp Asn Asp Asn Phe Arg  
385 390 395 400

Ile Lys Arg Tyr Ile Ser Lys Tyr Thr Ile Asn Pro Ala Leu Thr His  
405 410 415

Gly Val Ser Glu Tyr Ile Gly Ser Val Glu Glu Gly Lys Ile Ala Asp  
420 425 430

Leu Val Val Trp Asn Pro Ala Phe Phe Gly Val Lys Pro Lys Ile Val  
435 440 445

Ile Lys Gly Gly Met Val Val Phe Ser Glu Met Gly Asp Ser Asn Ala  
 450 , 455 460

Ser Val Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Gly His  
 465 470 475 480

His Gly Lys Ala Lys Phe Asp Thr Ser Ile Thr Phe Val Ser Lys Val  
 485 490 495

Ala Tyr Glu Asn Gly Val Lys Glu Lys Leu Gly Leu Glu Arg Lys Val  
 500 505 510

Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Phe Lys Phe  
 515 520 525

Asn Asp Lys Thr Ala Lys Ile Thr Val Asp Pro Lys Thr Phe Glu Val  
 530 535 540

Phe Val Asp Gly Lys Leu Cys Thr Ser Lys Pro Thr Ser Glu Val Pro  
 545 550 555 560

Leu Ala Gln Arg Tyr Thr Phe Phe  
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<211> 21

<212> DNA

<213> Helicobacter felis

<400> 16

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21

<210> 17

<211> 16

<212> DNA

<213> Helicobacter felis

<400> 17

tatggtgggc ttctct

16

<210> 18

<211> 32

<212> DNA

<213> Helicobacter felis

<400> 18

ggagtaacat atgaaactca cacccaaaga gc

32

<210> 19

<211> 27

<212> DNA

<213> Helicobacter felis

<400> 19

cacacccacg accatgtgag ggcttac

27

<210> 20

<211> 27

<212> DNA

<213> Helicobacter felis

<400> 20

gtaagccctc acatggctcg gggtgtg

27

<210> 21

<211> 34

<212> DNA

<213> Helicobacter felis

<400> 21

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34